California Monthly Climate Summary
July 2010

Weather Highlights

July 2010 was a mixed experience temperature wise and a drier than average precipitation month for California. According to the Western Region Climate Center's California Climate Tracker, the statewide monthly average temperature was 73.5°F which is 0.7°F higher than the long-term average. With a statewide average of 0.03 inches, precipitation for July was only 15% of the long term average. However, this year the statewide average for temperature may not be the best metric to gage what happened. Persistent on-shore flow and a deep marine layer led to the coastal regions of California and those parts of California impacted by the Delta breeze to experience below normal temperatures for July. Some of these reached record-setting proportions which will be described below. This experience was in stark contrast to other parts of the US and world that experienced record setting heat in July.

July 2010 began with a ridge of high pressure bringing above normal temperatures to the inland valleys and deserts. In the middle of the first week a long-wave trough moved over the northern part of the state bringing cooler air to the state and dropping temperatures below normal. In the second week coastal areas were impacted by a thick marine layer keeping temperatures low and in some cases producing a trace or few hundredths of an inch of precipitation. Over the Sierra Nevada Mountains, thunderstorms developed dropping locally heavy precipitation. Strong winds gusted through the Central Valley during this time as well. During the third week of July, the marine layer persisted in keeping the coastal areas cool while the rest of the state was near normal. In the latter part of the week a high pressure system moved in causing temperatures to soar past 100°F in the Central Valley and above 120°F in the southeast deserts. A thunderstorm impacted the San Diego region near the end of the week. The month ended with near normal conditions.

Preliminary records, reported on the National Weather Service Record Event Report, shows that statewide there were 216 temperature records tied or broken and 8 precipitation records tied or broken for the month. Of the 216 temperature records set in July, 7 were for new high maximum temperatures while 167 were for new low maximum temperatures. Records were set over 28 days of the month. Southern California led the way with the low maximum records. Los Angeles Airport reached monthly record low maximum temperatures twice with readings of 66°F on July 6th and then 65°F on July 8th. The first six days of July 2010 were cooler than the first six days of January 2010 for Downtown Los Angeles, Los Angeles Airport, Long Beach Airport, Santa Barbara Airport, and Oxnard. San Diego also tied its lowest maximum temperature for July on the 8th with a reading of 64°F. This broke the daily record low maximum temperature of 65°F set in 1902. While coastal regions of Southern California were experiencing record low temperatures, Las Vegas Nevada recorded its warmest month since records began in 1937. The monthly average temperature for

Las Vegas for July 2010 was 96.2°F. The previous record was set in July 2007 with a reading of 95.4°F. High temperatures exceeded 100°F every day of the month.

For the California Data Exchange Center's (CDEC) network of temperature gages used in this report, 18 stations recorded a minimum temperature below freezing in July while 107 stations reached or exceeded 100°F at least once during the month. Statewide extremes from the CDEC network of temperature gages are shown below. Also shown are the monthly average extremes from the CIMIS network. A table of regional average minimum, mean, and maximum temperatures from the CDEC and CIMIS networks is also shown at the end of the summary.

Precipitation in July was below average across the state. For the CDEC precipitation gages for July 2010, the largest amount of precipitation recorded was the Bridgeport Ranger Station in the Carson/Walker River Basins on the east side of the Sierra with 0.68 inches. This is 142% of the average precipitation for this station for July. At the other end of the spectrum, 41 stations reported zero inches of precipitation for the month. For the CIMIS network, Winchester in Riverside County topped the precipitation charts with 2.76 inches for the month and 81 stations recorded no precipitation. Some CIMIS gages may show large precipitation totals if the gages are not covered during irrigation activities so care should be given to review precipitation data used from this network. The 8-Station Index for northern California precipitation recorded 0.08 inches in July with 3 days showing precipitation. On average, 0.2 inches of precipitation is recorded for the 8-Station index in July. Statewide, the average precipitation for July was 29% of the long-term average based on the California Data Exchange Center (CDEC) gages. Precipitation percentages by region from the CDEC gages are shown in a table at the end of this document.

CoCoRaHS Update

July 2010 continues California's second year with CoCoRaHS – the Community Collaborative Rain, Hail and Snow Network. This group uses citizen volunteers to record rain, hail and snow data. The users enter the data online at the CoCoRaHS web site. The web site provides the opportunity to see spatial detail of rain and snow patterns in participating states. As of the end of July 2010, California has 672 volunteers signed up spanning 51 of California's 58 counties. The county with the most volunteers at the end of July is Sonoma with 85 volunteers. For the month of July 7,056 reports were recorded for California. The largest daily rain total for CoCoRaHS- CA in July was in Mono County with 0.94 inches recorded on 7/26/10. There were no hail reports submitted in July. A Placer County station recorded one inch of snow depth until July 5th. To join CoCoRaHS or find more information, please visit http://www.cocorahs.org.

Snowpack and Water Supply Conditions

The latest water supply index forecast for 2010 shows the Sacramento Basin in the Below Normal category and the San Joaquin Basin in the Above Normal category. Water year 2009 resulted in a Dry category for the Sacramento Basin and Below Normal for the San Joaquin Basin. Water supply information for California can be

found at http://cdec.water.ca.gov/water_supply.html. A historical listing of water year categories for both basins can be found at http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST.

Drought Monitor and Seasonal Outlook

The maps for California's depiction by the Drought Monitor for June 29, 2010 and July 27, 2010 are shown below. The Drought Monitor maps can be found on the National Drought Mitigation Center's (NDMC) website http://drought.unl.edu/dm/. These maps are largely a reflection of precipitation and soil moisture deficit estimates. As of the July 27th depiction, California is depicted in either D0 (abnormally dry), D1 (moderate drought), or D2 (severe drought) conditions. Drought conditions are now limited to the northeast corner of the state and along the California Oregon border. Drought free area in California was 87.5% for the depiction on July 27th. Maps are updated weekly.

The U.S. Seasonal Drought Outlook for August through October from NOAA depicts California with persisting drought conditions in the remaining drought areas as depicted by the Drought Monitor. This forecast is based on climatology. Updates are provided twice per month. Maps and information can be found at http://www.cpc.noaa.gov/products/expert_assessment/seasonal_drought.html.

The California Nevada River Forecast Center has produced some drought monitoring tools for California. These tools look at the frequency associated with precipitation deficits for the Northern California Eight Station Index and the San Joaquin Five Station Index. Another tool looks at the frequency of end-of-month storage for select reservoirs in California. The frequencies of the observations are related to the Drought Monitor's drought categories D0 through D4. These tools can be found at http://www.cnrfc.noaa.gov/climate.php. For July, the Eight Station Index is in drought free conditions for both the 12-month period and for the 24 month period. The Five Station Index is drought free for both periods as well. For the reservoirs for end-of-July storage, Casitas is the only reservoir at aD1 storage, Lake Tahoe, Lake Berryessa and Trinity Reservoir are at D0, and all other reservoirs on the graphic are considered to be drought-free.

ENSO Conditions and Long-Range Outlooks

The El Niño/Southern Oscillation (ENSO) is being classified as La Niña conditions. Equatorial sea surface temperature anomalies for the tropical Pacific continued to cool through July. The May through July 3-month running mean of the Ocean Niño Index (ONI) is -0.2 which does not cross the threshold to qualify for a La Niña event. Most forecast models have the tropical sea surface temperatures continuing to cool and La Nina conditions to persist through the rest of the year. More information can be found at the Climate Prediction Center's web site:
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/
Updates are posted weekly. The latest three month outlook (August through October) from NOAA indicates a higher probability of above normal temperatures for the interior

parts of the State and equal chances along the coast. For precipitation, the State has a higher probability of below normal precipitation for the eastern half of the state extending out to the coast from Santa Barbara southward. The remainder of the state has equal chances of above or below normal precipitation. Outlook plots and discussions can be fount at http://www.wrcc.dri.edu/longrang/. General weather information of interest can be found at http://www.noaawatch.gov/. For anomaly information please see http://www.wrcc.dri.edu/anom/cal_anom.html.

Agricultural Data

July 2010 saw crops developing, maturing, and being harvested. Wheat, oat and barley fields were harvested while alfalfa underwent its fourth cutting. Safflower fields bloomed and seed heads formed. Forages and small grains were harvested for hay and silage and fields disked after harvesting. Garbanzo bean fields were dried down. Blueberry, blackberry and strawberry harvests neared completion while apricot, plum, peach, and nectarine harvests were ongoing. Lemons, oranges and figs were picked while trees were pruned in cherry orchards. Hull splitting was reported in almond orchards across the state while walnut, pistachio and pecan nuts showed good size development. Summer vegetable crop harvest continued throughout the state including peppers, squash, eggplant, cucumbers, and tomatoes. Processing tomato harvest was delayed up to two weeks due to the cooler than average temperatures. Garlic was readied for harvest while harvests of watermelon, cantaloupe, parsley, and squash harvests completed in some counties. Carrot harvest began with fair quality reported. Rangeland deteriorated as a part of the annual summer drying. Supplemental feeding of livestock continued. Cattle showed good weight gains. Dairy production decreased in the hot weather. Bees were moved to alfalfa seed fields. For further crop information see http://www.nass.usda.gov/index.asp.

Other Climate Summaries

California Climate Tracker (new product of Western Region Climate Center)
Golden Gate Weather Service Climate Summary
NOAA Monthly State of the Climate Report

Statewide Extremes (CDEC)

High Temperature – 121°F (Mojave River Sink, South Lahontan)
Low Temperature – 11°F (Casa Vieja Meadows, Tulare Basin)
High Precipitation – 0.68 inches (Bridgeport Ranger Station, South Lahontan)
Low Precipitation – 0 inches (41 stations)

Statewide Extremes (CIMIS)

High Average Maximum Temperature – 118.7^{0}F (UC San Luis, Imperial County)
Low Average Minimum Temperature – 43.5^{0}F (Alturas, Modoc County)
High Precipitation – 2.76 inches (Winchester, Riverside County)*
Low Precipitation – 0 inches (81 stations)
*Sometimes irrigation water from sprinklers gets counted as precipitation if the gage is not covered.

Statewide Precipitation Statistics

Hydrologic Region	Region Weight	Basin Reporting			Stations Reporting			% of Historic Average	
		Basins	Jul	Oct-Jul	Stations	Jul	Oct-Jul	Jul	Oct-Jul
North Coast	0.27	5	2	2	19	4	4	25.9%	94%
SF Bay	0.03	2	1	1	6	1	1	0.0%	117%
Central Coast	0.06	3	2	2	11	3	3	25.0%	124%
South Coast	0.06	3	2	2	15	8	7	76.7%	107%
Sacramento River	0.26	5	5	5	43	14	13	16.5%	94%
San Joaquin River	0.12	6	5	5	25	10	10	0.0%	118%
Tulare Lake	0.07	5	5	5	28	24	24	87.9%	112%
North Lahontan	0.04	3	3	3	14	7	6	59.7%	91%
South Lahontan	0.06	3	2	2	15	2	2	45.2%	120%
Colorado River	0.03	1	1	1	6	2	1	10.0%	138%
Statewide Weighted Average	1	36	28	28	182	75	71	28.94%	104%

Statewide Mean Temperature Data by Hydrologic Region (degrees F)

Hydrologic Region	No. Stations	Minimum	Average	Maximum
North Coast	29	43.7	67.6	90.8
SF Bay	17	50.6	65.8	84.8
Central Coast	36	51.2	63.9	81.6
South Coast	65	52.8	70.2	95.0
Sacramento	90	49.2	73.0	95.4
San Joaquin	73	52.7	72.7	92.9
Tulare Lake	19	42.4	64.8	85.3
North Lahontan	10	40.2	68.4	91.9
South Lahontan	21	51.7	73.2	92.9
Colorado River Desert	22	73.3	92.4	108.3
Statewide Weighted Average	382	48.5	70.4	92.1

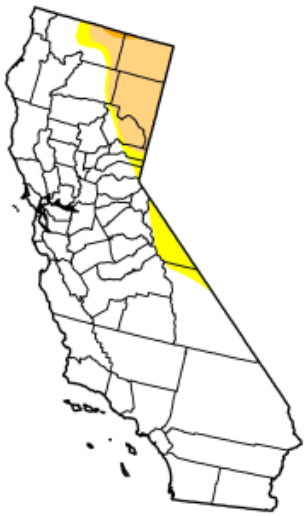
U.S. Drought Monitor

California

June 29, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	88.0	12.0	8.1	0.2	0.0	0.0
Last Week (06/22/2010 map)	88.0	12.0	8.1	0.2	0.0	0.0
3 Months Ago (04/06/2010 map)	63.2	36.8	9.9	7.1	0.0	0.0
Start of Calendar Year (01/05/2010 map)	6.6	93.4	72.8	9.0	0.0	0.0
Start of Water Year (10/06/2009 map)	0.0	100.0	73.4	45.8	0.0	0.0
One Year Ago (06/30/2009 map)	2.9	97.1	72.0	44.3	0.0	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

http://drought.unl.edu/dm

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Author: R. Tinker, CPC/NOAA

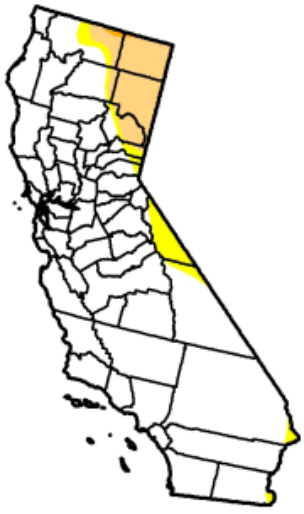
U.S. Drought Monitor

California

July 27, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	87.5	12.5	8.1	0.2	0.0	0.0
Last Week (07/20/2010 map)	87.8	12.2	8.1	0.2	0.0	0.0
3 Months Ago (05/04/2010 map)	72.8	27.2	9.9	7.1	0.0	0.0
Start of Calendar Year (01/05/2010 map)	6.6	93.4	72.8	9.0	0.0	0.0
Start of Water Year (10/06/2009 map)	0.0	100.0	73.4	45.8	0.0	0.0
One Year Ago (07/28/2009 map)	2.5	97.5	72.8	44.3	0.0	0.0



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http://drought.unl.edu/dm

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